J.R. Simplot Company
P.O. Box 912,
Pocatello, Idaho 83204

208 235-5600 Business

November 27, 2018

Arthur Burbank
Remedial Project Manager
Forest Service Intermountain Region
4350 South Cliffs Drive
Pocatello, ID 83204

Subject: Smoky Canyon Mine Remedial Investigation/Feasibility Study
Dinwoody Material Source Investigation Report

Dear Art,

Attached for your review is the *Dinwoody Material Source Investigation Report* for your review. The J.R. Simplot Company (Simplot) is providing this final information in accordance with the August 2009 Settlement Agreement/Consent Order, as part of the Remedial Investigation/Feasibility Study (RI/FS) conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

This document was transmitted electronically but can also be downloaded at the website:
(b) (6)
Login: (b) (6)
Password (case sensitive): (b) (6)

Please contact me if there are questions regarding this submittal.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

cc: (1 copy except as otherwise noted)
Arthur Burbank – USFS, 410 East Hooper, Soda Springs, ID 83276 (unbound)
Sherri Stumbo – USFS, 4350 South Cliffs Dr., Pocatello, ID 83204
Rick McCormick – Jacobs, email only
Jeff Osterman – Jacobs, email only
Douglas Tanner – IDEQ, email only
Kathryn Venable – IDEQ, email only
Brady Johnson – IDEQ, email only
Colleen O'Hara – BLM, email only
Sandi Fisher – USFWS, email only
Jeremy Moore – USFWS, 4425 Burley Dr., Suite A, Chubbuck, ID 83202
Matt Wilkening – USEPA, email only

J.R. Simplot Company
P.O. Box 912,
Pocatello, Idaho 83204

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cc: (continued)
Susan Hanson – (b) (6), Pocatello, ID 83202
Gary Billman – IDL, email only
Alan Prouty – J.R. Simplot Company, email only
Burl Ackerman – J.R. Simplot Company, email only
Dedra Williams – J.R. Simplot Company, email only
Lori Hamann – J.R. Simplot Company, email only
Chad Gentry – J.R. Simplot Company, email only
Grant Williams – J.R. Simplot Company, email only
Ron Quinn – J.R. Simplot Company, 1890 Smoky Canyon Mine Road, Afton, WY 83110
Andy Koulermos – Formation Environmental, email only

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Bringing Earth's Resources to Life

**Smoky Canyon Mine**

***To:*** Jeff Hamilton, Environmental Engineering Manager; Grant Williams, Senior Mine Engineer

***From:*** Katie Wilkes, Geologist

***Cc:*** Neil Musilek, Engineering Manager; Casey McCaslin, Survey

**Date:** November 27, 2018

***Re:*** **Dinwoody Material Source Investigation Report**

The objective of this investigation is to provide site-specific information needed for the detailed analysis of remedial alternatives in the FS by locating, delineating, and estimating available volumes of Dinwoody material for potential future use. The potential borrow sources investigated for further evaluations included B-Panel A & B, West Smoky C, D-Panel A & B, and E-Panel A & B. **Figure 1** shows the areas included in this investigation.

Dinwoody Formation is visibly present in the constructed road cuts and pads; however, the material type varies from site to site. Excavations at each site varied in depth and were limited by either material type or equipment reach. Photo documentation is provided for cuts, pads, and excavations at the sites. It should also be noted that the cut associated with constructing access to sites is included in determining material thickness. Site specific descriptions included logging the differences between Type A, Type B, and unsuitable Dinwoody material will be indicated by changes in color, clay content, field durability testing, and test pit excavation equipment behavior.

**Volume Estimates**

Distinct characteristics and variable weathering make each dig location unique. Because of a lack of homogeneity a simplified approach to calculating potential volumes of recoverable Dinwoody was employed. Each area was looked at as a whole to determine the depth of topsoil to be removed and appropriate depth of extractable material or refusal. Depth and area are the controlling factors determined by the excavations, while borrow designs were standardized 2:1 cuts from surface without attention to drainage or other slope stability considerations.

The areas involved in the calculations were based on the original delineated borrow areas but modified based on field observations. Volumes are not indicative of material quality but signify the amount of material in the area that appears to be available for excavation. **Table 1** includes updated areas and volumes for the borrow areas along with a description of the material type cover suitability.

**B-Panel Borrow Area**

Documentation for each excavation site and any other field observations are in the trench logs attachment. B-Panel borrow contained excellent clay rich material overall. All excavations in this area were extended to the maximum reach of the equipment. Site DW_BB02 had some less desirable gravely zones near the surface and has been adjusted to the edge or the borrow area. **Figure 2** indicates the areas of the original B-Panel borrow designs and the new adaptations following examinations from this field program. Selected images for each site are included in this report, additional photo documentation is available within the attachments.

Volumes in this area were updated anticipating removal of 4 feet of topsoil with an overall 30 foot deep excavation below topography. Good material likely exists deeper as the termination of the excavations were in good clay material at the bottom.

**West Smoky C Borrow Area**

Overhead and buried power lines extend the entire length of the proposed borrow site therefore it was not evaluated.

**D-Panel Borrow Area**

All sites were terminated at refusal of digging and ripper teeth were broken on the rock at sites DA01 and DA03. Although none of the excavation sites indicated good quality Dinwoody cover material, road cuts were considered in evaluation of the site as a whole. Additional field notes for the D-Panel borrow areas and excavation sites are in the trench logs attachment. A general observation in the steep D and E panel areas is that there is more cliff forming rock with elevation up the slope. **Figure 3** indicates the areas of the original D-Borrow designs and the adaptations following examination from this field program. Selected images for each site are included in this report and additional photo documentation is available within the attachments.

Volumes in this area were updated within a much smaller areas. Calculations within this area assumed 3 feet of topsoil and 10 feet total depth for excavating material below topography. Despite the conservative estimate, it is still unlikely that all the area that could be excavated would be suitable for cover material.

**E-Panel Borrow Area**

All sites were terminated at refusal of digging through rock. EA01 and EB02 were completed nearly at the surface. None of the excavation sites indicated a large quantity of good cover-quality Dinwoody. Alternating rock and loose material in some locations saw better digging below the surface rock outcrops although none or the trenches were extended to the reach of the equipment before refusal. The upslope extent for accumulation of usable, weathered Dinwoody appears to coincide with the areas of existing borrows in both D and E panel. Additional field notes for the E-Panel borrow excavation sites are in the trench logs attachment.

**Figure 4** indicates the areas of the original E-Borrow designs and the adaptations following examinations from this field program. Selected images for each site are included in this report with additional photo documentation available within the attachments.

Volumes in this area were updated within a much smaller areas. Calculations within this area assumed 3 feet of topsoil and 15 feet total depth for excavating material below topography. Most of this material would not be suitable for cover material.

## Figure1 – RI Dinwoody Borrow Test Excavation Sites

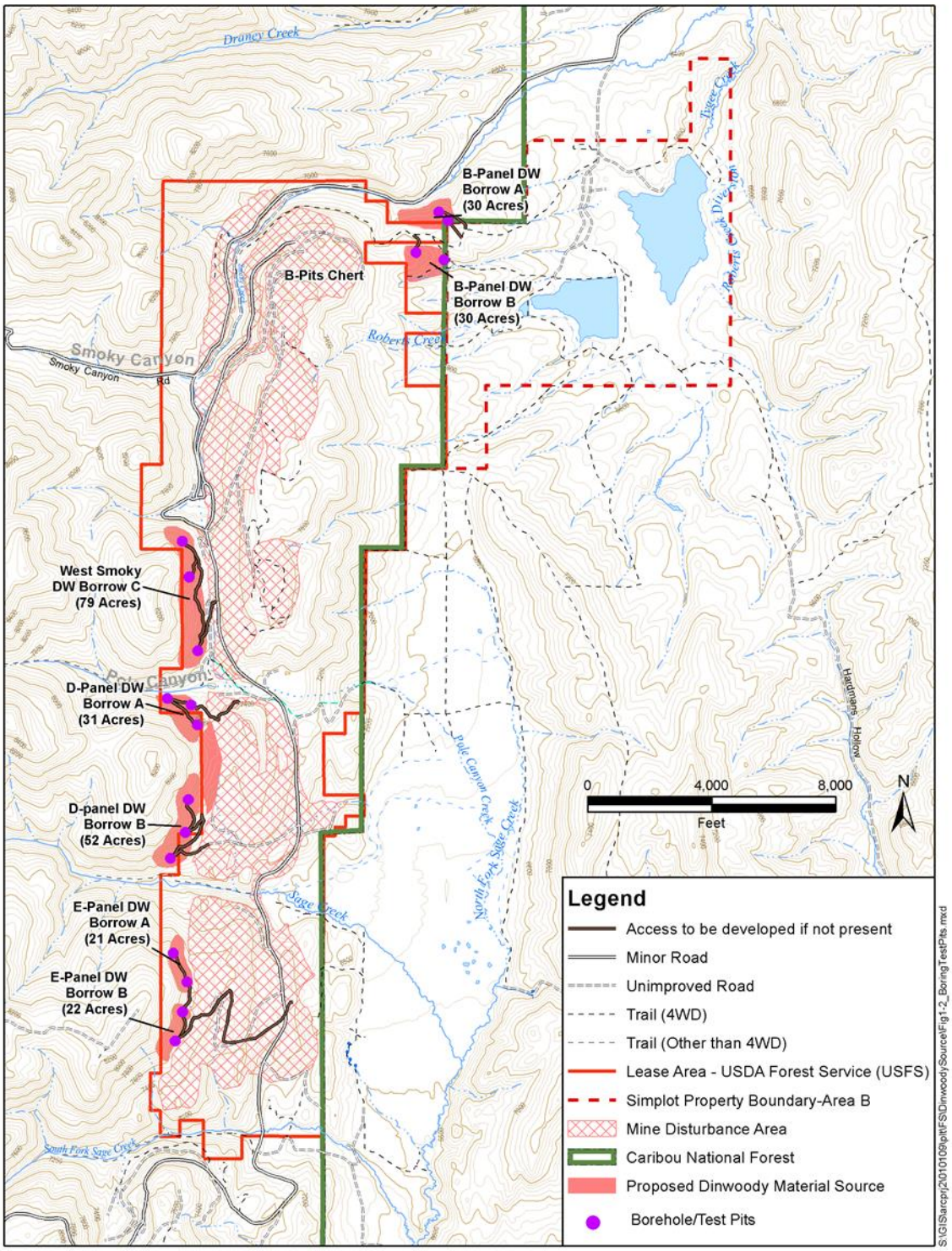
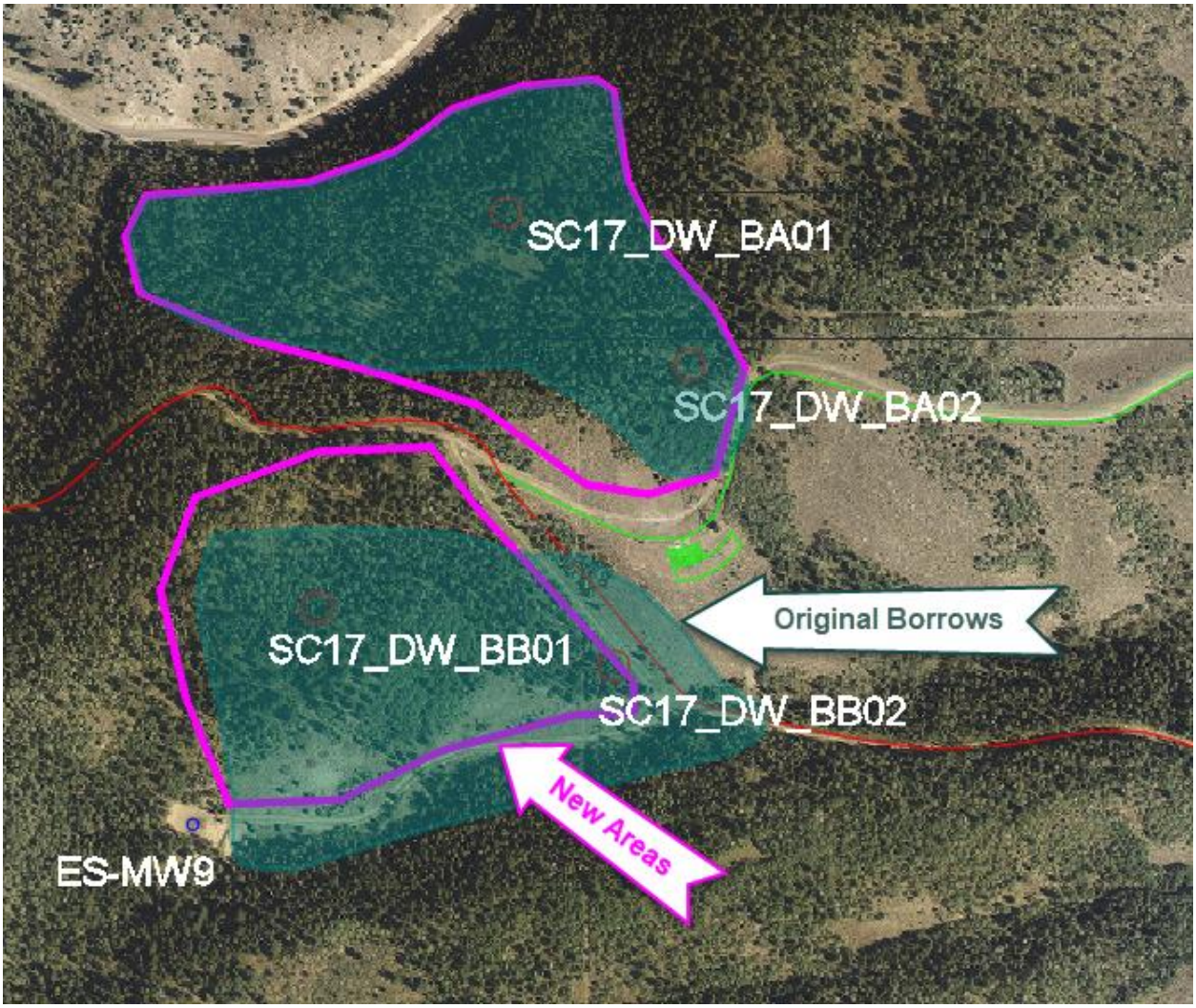


**Figure 2 – B-Panel Borrow**



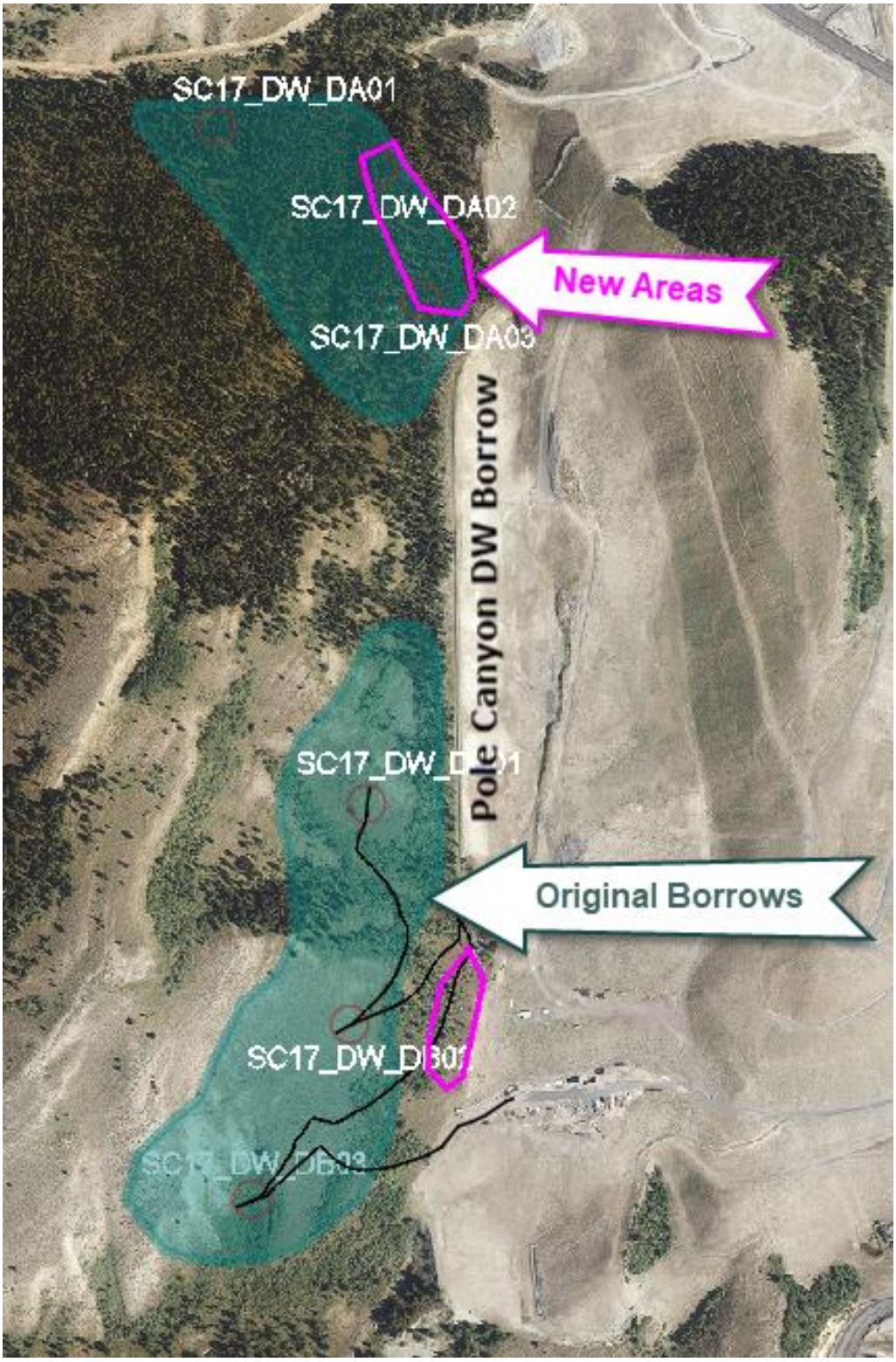
## DW_ BA01

## DW_ BA02

## DW_ BB01

## DW_ BB02

**Figure 3 – D-Panel Borrow**



## DW_ DA01

## DW_ DA02

## DW_DA03

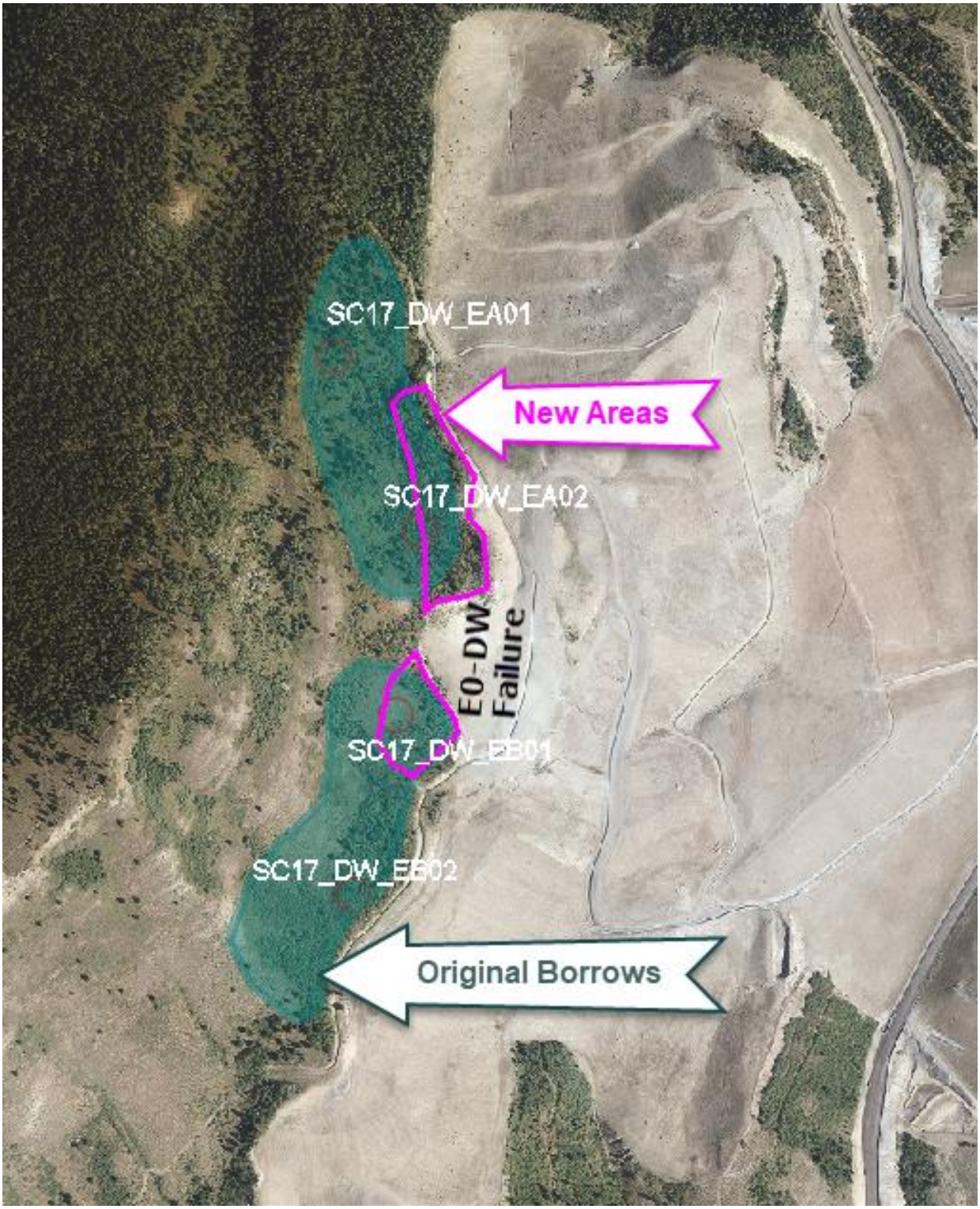
## DW_ DB01

## DW_ DB02

## DW_DB03

## D-Panel Borrow B Road Cut

**Figure 4– E-Panel Borrow**



**DW_ EA01**

## DW_ EA02

## DW_ EB01

**DW_ EB02**

**Table 1**

| Proposed Borrow Area ID | Area (Acres) | Estimated Recoverable DW Volume (CY) | NEW Area (Acres) | NEW Estimated Recoverable DW Volume (CY) | Borrow Material Suitability Type Description |
|---|---|---|---|---|---|
| B-Panel DW Borrow A | 36.3 | 960,453 | 39.7 | 1,590,000 | Good Clay |
| B-Panel DW Borrow B | 38 | 1,005,433 | 31.8 | 1,280,000 | Good Clay |
| West Smoky DW Borrow C | 79.2 | 2,095,535 | 0 | - | n/a |
| D-Panel DW Borrow A | 31.5 | 833,451 | 5.1 | 55,000 | Poor Gravely/Rock |
| D-panel DW Borrow B | 52.2 | 1,381,148 | 2.5 | 26,000 | Poor Gravely/Rock |
| E-Panel DW Borrow A | 21.4 | 566,218 | 7 | 125,000 | Poor Gravely/Rock |
| E-Panel DW Borrow B | 22.3 | 590,031 | 3.7 | 65,000 | Poor Gravely/Rock |

**Borrow Area B**

10/09/2018- Snow

DW_BB01

0-3 Soil (OL) organic silt/clay

3-15 yellowish-orange DW (CH) Stiff Clay – good

15-25+TD olive-grey DW (CH) Stiff/Very Stiff to Hard Clay – good

DW_BB02

0-5 Soil (GC) clayey gravels/ sand-clay mixture

5-10 well rounded (GC) mixture cobbles –gravel/clay – poor

10-25+TD light brown DW (CH) Stiff to Hard clay – good

10/10/2018 – Snow

DW_BA01

0-4 Soil (OL) organic silt/clay

4-25+TD light brownish orange-grey DW (CH) soft to stiff clay, moldable – good

DW_BA02

0-4 Soil (OL) organic silt/clay

4-25+TD yellowish orange-tan DW (CH) very stiff to hard clay, platy – good

**Borrow Area C**

DW_C Borrow area runs parallel with overhead and underground power lines and cannot be utilized as a borrow area.

**Borrow Area D**

10/18/2018 – Clear and Cool

DW_DA01

0-2 Soil (GC) light brown angular clayey gravels, fine sand-clay mixture

2-22+/-TD dark brown-red staining/dark grey rocky DW shale/limestone boulders/cobbles – bad

Refusal @ TD (broken ripper tooth)

DW_DA02

0-3 Soil (GC) light brown angular clayey gravels, fine sand-clay mixture

3-15 light brown/light grey DW rocks, clayey matrix ~40% gravel, ~5+% cobbles – poor

Grades into boulder rocks at varying depth

15-20 light brown/light grey DW shale/limestone rock –bad

10/22/2018 – Partly Cloudy

DW_DA03

0-1.5 Soil (ML) light brown fine silty-clay mixture

1.5-5 light brown/light grey (GC) DW rocks, gravel-cobble in clay-silt matrix– poor

Grades into boulder size shale/limestone rocks

5-14+TD light grey/light brown DW shale/limestone rock –bad

Refusal @ TD (broken ripper tooth)

10/23/2018 – Mostly Cloudy/ Scattered Rain Showers

DW_DB01

0-2+ Soil (OL) dark brown fine silty-clay matrix

2-13+TD reddish brown/light grey DW shale/limestone rock – bad

10’ from top of cut to pad plus 3’ trench

DW_DA02

0-7 Soil (GC/ML) light brown – yellowish and light grey fine silty-clay mixture with some angular gravel some plasticity –poor

Grades into boulder size shale/limestone rocks

7-15+TD light grey/light brown DW shale/limestone rock – bad

DW_DB03

0-4+ Soil bottom of roots (GC) light brown fine silty-clay matrix with gravely shale rock

4-7+TD yellowish/orange and light grey DW shale rock, interbedded seams of dark red-brown limestone rock– bad

Additional note: half of the first switch back looked to have up to/ at least 5 feet of decent fine grain clayey material in the road cut. This is only present lower on the slope/switchback and full east facing slope. The south facing slope has significantly more hard silty shale with low plasticity and clay content, an apparent contact for this material type around the edge of the slope appears to be parallel with the pillar like cliff outcrop overlooking Sage Creek below the D boneyard.

**Borrow Area E**

The excavator operator encountered hard rock and abandoned the dig at the surface on 10/29 and 10/30 at DW_EA01 and DW_EB02 respectively.

10/30/2018 – partly cloudy and cool

DW_EB01

0-3 Soil with roots (OL/GC) reddish brown fine silty-clay matrix with gravely shale rock

3-21+TD (GM) light reddish brown silty matrix and interbedded light grey DW shale rock– poor

9’ from top of cut to pad plus 12’ trench

DW_EA02

0-3 Soil with plasticity and roots (OL/GC) light reddish brown fine silty-clay matrix with some gravel

3-8 light brown and grey large DW shale/limestone rocks – bad

8-16+TD (GM) light brown and grey DW shale rocks in low plasticity silty matrix, interbedded seams of dark red-brown limestone – poor

8’ from top of cut to pad plus 8’ trench